Sidak 3rd Supplemental analyzes the profitability of increasing the number of commercials by drawing isoprofit curves, as shown in Figure 2 of Sidak 3rd Supplemental. That figure shows that in Sidak's model the firm might increase profits by adding a certain number of commercials *at the initial subscription price*, but it does not show that a profit-maximizing firm would adopt such a constant price strategy. In fact, adding commercials would give a profit-maximizing firm the incentive to reduce its subscription price.

This can be shown formally as follows. In Sidak's model, the firm's profit function is given by:

$$\Pi = (P + at)Q \qquad (2)$$

where at denotes the advertising revenue per subscriber, that is, a is the advertising revenue per unit of advertising and t is the amount of advertising. Using Equation (1) to substitute for P, the first-order condition of profit-maximization yields:[10]

$$P^* = P^0 - \frac{at}{2} - \frac{uvt}{2T} \qquad (3)$$

$$Q^* = Q^0 + \frac{at}{2b(1 - vt/T)} \qquad (4)$$

It is straightforward to show that when the number of commercials is larger, the profit-maximizing price P^* is lower. Formally, P^* is decreasing in t.[11] Similarly, it is straightforward to show that when the number of commercials is larger, the profit-maximizing number of subscribers Q^* is higher. Formally, Q^* is increasing in t. This proves that Sidak's

[10] For the profit function given in Equation (2), the first-order condition is: $P + at + (\partial P / \partial Q)Q = 0$. (We assume an interior solution, i.e., the profit-maximizing subscription price is greater than zero. This assumption is satisfied in all the scenarios considered by Sidak.) From Equation (1), we have $P = (u - bQ)(1 - vt/T)$ and $\partial P / \partial Q = -b(1 - vt/T)$. Substituting into the first-order condition and solving for Q, we find Q^* as given in Equation (4). Evaluating Equation (1) at $Q = Q^*$, we find P^* as given in Equation (3). (We can use $P^0 = u/2$ and $Q^0 = u/2b$ to simplify Equations (3) and (4). See footnote 3.)

[11] The profit-maximizing price is decreasing in t for two reasons. First, the advertising revenue per subscriber, at, tends to increase the profit margin and thus is equivalent to a marginal cost reduction. Second, the assumption that demand pivots around the horizontal intercept implies that demand becomes more elastic (at any given price) as the number of commercials increases. These two effects correspond to the two negative terms in Equation (3).

model, when properly analyzed, predicts that an increase in the number of commercials would lead the firm to reduce price and increase the number of subscribers.

These results are shown graphically in Figure B2.

Figure B2: Sidak's model properly analyzed

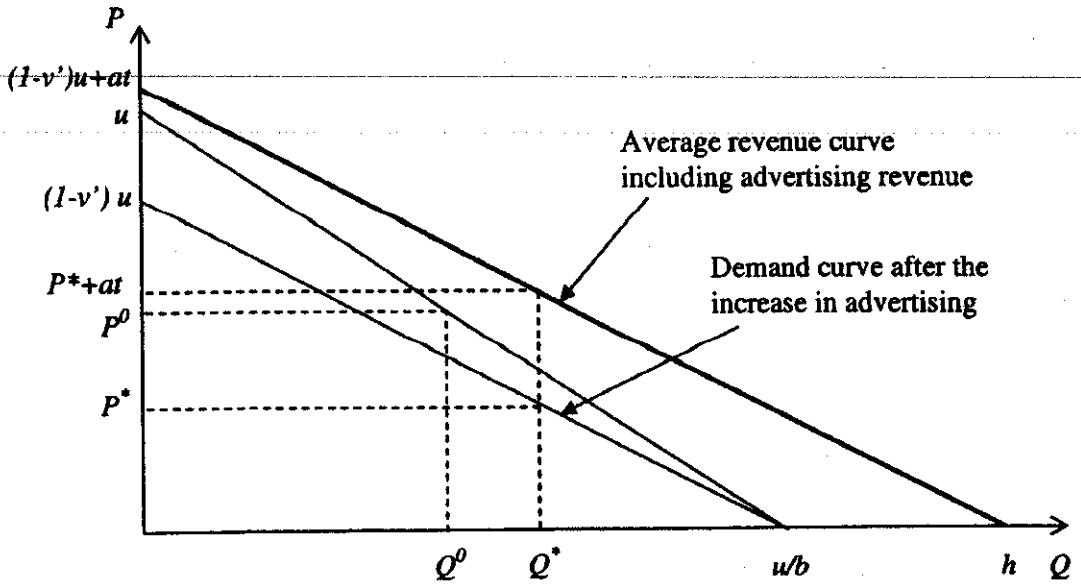


Figure B2 completes Figure B1 by depicting the average revenue curve that includes the advertising revenue per subscriber. This average revenue curve is parallel to the new demand curve after the increase in advertising (i.e., it is the new demand curve shifted upward parallel by the amount at). The horizontal intercept of the average revenue curve – denoted by h in Figure B2 – is larger than the horizontal intercept of the demand curves, u/b. This fact must be true because the average revenue curve is everywhere above the new demand curve (with commercials) since it is an upward parallel shift of the new demand curve.[12]

[12] In Figure B2, the vertical intercept of the average revenue curve (i.e., $(1-v')u + at$) is assumed to be higher than the vertical intercept of the initial demand curve (i.e., u). This is just a convenient assumption that allows us to draw a clear picture. Our results do not depend on that assumption. Even if this vertical intercept is below u, the new average revenue curve is still a parallel upward shift above the new demand curve and thus the horizontal intercept h must be larger than u/b.

Given the assumption of zero marginal cost, the equilibrium number of subscribers, Q^*, is equal to $h/2$, where h is the horizontal intercept of the average revenue curve. (Analogously, the initial number of subscribers, Q^0, is equal to $u/2b$.) The equilibrium price, P^*, is then determined by the new demand curve at Q^*.[13]

In summary, Sidak should have taken into account the fact that adding t minutes of commercials (beginning from the initial situation of no commercials and a monthly subscription price of $12.99) would give a profit-maximizing firm the economic incentive to lower its subscription price.[14] Had Sidak calculated the profit-maximizing price, he would have discovered that in his model the addition of t minutes of commercials results in a lower price and increased output.

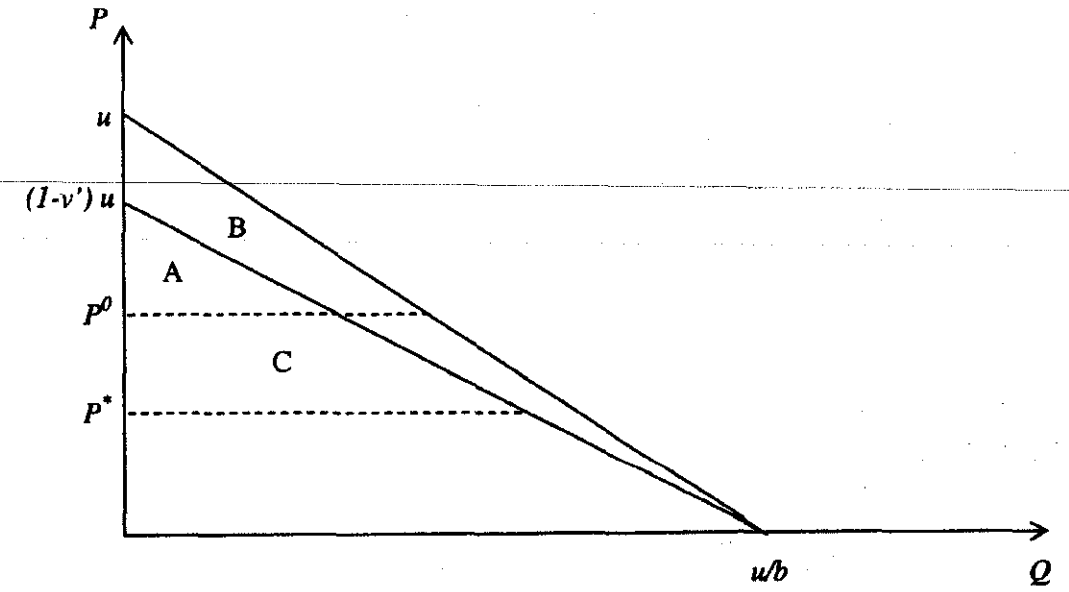
4. IMPACT ON CONSUMER WELFARE

This lower price and increased output combine to create a positive consumer welfare effect. The welfare effects generated by an increase in advertising and the profit-maximizing reduction in price (called for by the increase in advertising) are shown in Figure 3. (We have removed the average revenue curve to make Figure B3 less cluttered.)

[13] The equilibrium average revenue per subscriber, $P^* + at$, is equal to one-half of the vertical intercept of the average revenue curve, i.e., $P^* + at = [(1 - v')u + at]/2$. Since $v' = vt/T$, this leads to the same expression for P^* as in Equation (3).

[14] Note that the current subscription price is in fact $12.95, but Sidak appears to use $12.99 throughout his analysis. This difference does not affect the qualitative results.

Figure B3: Consumer Welfare Effects



Specifically, the initial amount of consumer surplus before the increase in advertising corresponds to the area below the initial demand curve and above P^0. That area is the sum of Area A and Area B in Figure B3. After the increase in advertising and the reduction in price, consumer surplus corresponds to the area below the new demand curve and above P^*. That area is the sum of Area A and Area C in Figure 3. It follows that Area B is the loss in consumer surplus from the increase in advertising (if price remained the same and output fell accordingly), while Area C is the additional gain in consumer surplus from the reduction in price and increase in quantity. The net effect on consumer surplus (i.e., consumer welfare), therefore, is the difference between Area C and Area B.

When the firm is allowed to set the profit-maximizing price, Area C is larger than Area B in all the scenarios considered by Sidak where the assumed increase in advertising would be profitable. This means that the negative consumer surplus from adding commercials (i.e., Area B) is more than outweighed by the positive consumer surplus from reducing the profit-maximizing price and increasing the number of subscribers (Area C). Therefore, in Sidak's model, the effect of adding

t minutes of commercials has a positive net consumer welfare effect, once we account for the impact of adding commercials on profit-maximizing pricing incentives.

These results are shown in Tables B1-B3 below. The Tables report the effects of adding commercials on price, output and consumer welfare. The results are presented for the various scenarios considered by Sidak.

Table B1

Price Effect of Adding Five Minutes of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	- $1.31	NA	NA
	$0.50	- $1.94	- $3.32	NA
	$1.00	- $3.19	- $4.57	- $5.95
	$1.50	- $4.44	- $5.82	- $7.20
Sidak's Incorrect Results (i.e., assuming constant price)		$0	$0	$0

Sidak assumed that the merged firm would not reduce price despite the fact that doing so would increase its profits. In contrast, Table B1 reports the effect on the profit-maximizing price of adding five minutes of commercials per hour (i.e., $t = 5$). For example, suppose that consumers attribute 30% of the value of satellite radio to its commercial-free nature, and the advertising revenue per unit equals $1. In this case, adding five minutes of commercials would lead a profit-maximizing firm to reduce the monthly subscription price by $4.57.[15] Table B1 reports the price reductions for every profitable scenario among those considered by Sidak. The results are not reported for those few scenarios where the assumed increase in advertising would not be a

[15] The $4.57 reduction in price would be smaller than the $5 increase in advertising revenues. Thus, the firm's average revenue per subscriber would increase by $0.43.

profitable strategy (relative to no increase in the number of commercials) and thus would not be carried out. Those unprofitable scenarios instead are labelled as "NA" (i.e., "Not Applicable").

Sidak also considered different scenarios where the firm would add $t = 1$ or $t = 3$ minutes of commercials. The price effects in those scenarios are proportional to those reported in Table B1.[16] See Tables B4-B6 at the end of this Appendix.

Table B2

Output Effect of Adding Five Minutes of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	+5%	NA	NA
	$0.50	+10%	+11%	NA
	$1.00	+20%	+23%	+26%
	$1.50	+30%	+34%	+39%
Sidak's Incorrect Results (i.e., assuming constant price)		- 6%	- 19%	- 36%

Table B2 reports the effect on the profit-maximizing number of subscribers of adding five minutes of commercials (as in Table B1). Consider the same example where consumers attribute 30% of the value to commercial-free and the advertising revenue per unit is $1. Then, a profit-maximizing firm would reduce price by $4.57 (see Table B1) and that in turn would lead to a 23% increase in the number of subscribers despite the increase in advertising. Table B2 shows the output increase for every profitable scenario among those considered by Sidak. In sharp contrast, because Sidak assumed a constant price, Sidak erroneously found that output would decrease, as shown in the last row of Table B2.

[16] For example, suppose that $v = 30\%$, $a = \$1$ and $t = 1$ (as opposed to $t = 5$). Then, the price would decrease by about $0.91 (i.e., $4.57 divided by 5).

In the other scenarios considered by Sidak – where the merged firm would add 1 or 3 (as opposed to 5) minutes of commercials – the output effects are smaller in magnitude but qualitatively similar to those reported in Table B2. See Tables B5a-B5b at the end of this Appendix.

Table B3

Consumer Welfare Effect of Adding Five Minutes of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	+ $60 mil	NA	NA
	$0.50	+ $198 mil	+ $59 mil	NA
	$1.00	+ $491 mil	+ $357 mil	+ $225 mil
	$1.50	+ $811 mil	+ $685 mil	+ $564 mil
Sidak's Incorrect Results (i.e., assuming constant price)		- $211 mil	- $633 mil	- $1055 mil

Table B3 reports the net effect on consumer surplus – from the increase in advertising, the reduction in price, and the increase in output – of adding five minutes of commercials (as in Tables B1-B2). Consider again the example where consumers attribute 30% of the value to commercial-free and the advertising revenue per unit is $1. Then, a profit-maximizing firm would reduce price by $4.57 (see Table 1). The net effect on output of the price reduction and the increase in advertising would be a 23% increase in the number of subscribers (see Table B2). Table 3 shows that the increase in advertising, together with the profit-maximizing reduction in price and increase in output, would lead to a net consumer welfare gain of $357 million per year. Table B3 shows the consumer welfare gains that would occur in every profitable scenario among those considered by Sidak. Again, because Sidak ignored the fact that an increase in advertising would give the firm a profit-maximizing incentive to reduce price, Sidak erroneously found that

consumers would be harmed (see the last row of Table B3) when, in fact, his own model predicts the opposite.[17]

Similar results apply to the other scenarios considered by Sidak. See Tables B1a-b, B2a-b, and B3a-b at the end of this Appendix.

[17] As a matter of completeness, we note that Sidak's calculation of the welfare loss appears incorrect, even under his assumption of constant price and a reduced number of subscribers. His welfare loss calculation assumes that the number of subscribers is constant, not that it falls as a result of adding commercials. For example, in deriving the welfare loss of $1.055 billion (when it is assumed that there are 5 minutes of commercials and commercial-free accounts for 50% of consumers' willingness to pay), Sidak assumes 17 million subscribers, the same number as before adding the commercials. See Sidak Supplemental at ¶43-44. In Sidak 3rd Supplemental, that same welfare loss of $1.055 billion is reported in Figure 2 (when $t = 5$ and $v = 50\%$). See Sidak 3rd Supplemental at ¶73. However, Sidak also notes here that 36% of subscribers would terminate their subscriptions as a result of the commercials, and yet his welfare loss calculation is not adjusted to take account of those terminations. (The welfare loss would be somewhat smaller; those subscribers would terminate because their willingness-to-pay would fall below the subscription price; termination gives them zero surplus instead of negative surplus.) Of course, this relatively small error is irrelevant. Sidak's entire methodology is analytically incorrect because it ignores an important fact: Following an increase in advertising, a profit-maximizing firm would reduce price, which in turn would increase the number of subscribers and consumer welfare.

REDACTED

FOR PUBLIC INSPECTION

Table B1a

Price Effect of Adding One Minute of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	- $0.26	NA	NA
	$0.50	- $0.39	- $0.66	NA
	$1.00	- $0.64	- $0.91	- $1.19
	$1.50	- $0.89	- $1.16	- $1.44
Sidak's Incorrect Results (i.e., assuming constant price)		$0	$0	$0

Table B1b

Price Effect of Adding Three Minutes of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	- $0.79	NA	NA
	$0.50	- $1.16	- $1.99	NA
	$1.00	- $1.91	- $2.74	- $3.57
	$1.50	- $2.66	- $3.49	- $4.32
Sidak's Incorrect Results (i.e., assuming constant price)		$0	$0	$0

REDACTED

FOR PUBLIC INSPECTION

Table B2a

Output Effect of Adding One Minute of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	+1%	NA	NA
	$0.50	+2%	+2%	NA
	$1.00	+4%	+4%	+4%
	$1.50	+6%	+6%	+6%
Sidak's Incorrect Results (i.e., assuming constant price)		- 1%	- 2%	- 3%

Note. In Figure 2 of Sidak 3rd Supplemental, the results reported for $t = 1$ appear to have been derived assuming $t = 0.5$ (not $t = 1$). The last row of Table B2a reports those results.

Table B2b

Output Effect of Adding Three Minutes of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	+3%	NA	NA
	$0.50	+6%	+6%	NA
	$1.00	+12%	+13%	+14%
	$1.50	+18%	+19%	+21%
Sidak's Incorrect Results (i.e., assuming constant price)		- 3%	- 11%	- 19%

REDACTED

FOR PUBLIC INSPECTION

Table B3a

Consumer Welfare Effect of Adding One Minute of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	+$12 mil	NA	NA
	$0.50	+$37 mil	+$9 mil	NA
	$1.00	+$90 mil	+$62 mil	+$34 mil
	$1.50	+$143 mil	+$115 mil	+$87 mil
Sidak's Incorrect Results (i.e., assuming constant price)		- $21 mil	- $63 mil	- $105 mil

Note. In Figure 2 of Sidak 3rd Supplemental, the results reported for $t = 1$ appear to have been derived assuming $t = 0.5$ (not $t = 1$). The last row of Table B3a reports those results.

Table B3b

Consumer Welfare Effect of Adding Three Minutes of Commercials per Hour

		Fraction Of Value Attributed To Commercial-Free (v)		
		10%	**30%**	**50%**
Advertising Revenue Per Unit (a)	**$0.25**	+$35 mil	NA	NA
	$0.50	+$115 mil	+$31 mil	NA
	$1.00	+$282 mil	+$199 mil	+$116 mil
	$1.50	+$458 mil	+$376 mil	+$295 mil
Sidak's Incorrect Results (i.e., assuming constant price)		- $127 mil	- $380 mil	- $633

REDACTED

FOR PUBLIC INSPECTION

EXHIBIT

Recent Satellite Radio Subscriber Projections

Source and Report Date		2006 (Acutals)[1]	2007	2008	2009	2010	2011	2012	2013	2014	2015
Goldman Sachs[2]	XM	7,629	9,100	10,500	12,000	13,500					
(Oct-2007)	Sirius	6,025	8,300	10,100	11,200	12,300					
	Total	13,654	17,400	20,600	23,200	25,800					
Wedbush Morgan Securities[3]	XM	7,629	9,076	10,669	12,274	13,670	14,835	15,810	16,594	17,407	18,039
(Oct-2007)	Sirius	6,025	8,231	10,105	11,681	12,965	14,218	15,396	16,399	17,260	18,024
	Total	13,654	17,307	20,774	23,955	26,635	29,053	31,206	32,993	34,667	36,063
Stanford Group Company[4]	XM	7,629	8,850	9,950	11,000	12,000					
(Sept-2007)	Sirius	6,025	8,300	10,000	11,400	12,500					
	Total	13,654	17,150	19,950	22,400	24,500					
Deutsche Bank[5]	XM	7,629	8,985	10,571	12,429	14,418					
(Jul-2007)	Sirius	6,025	8,100	9,894	12,115	14,100					
	Total	13,654	17,085	20,465	24,544	28,518					
Credit Suisse[6]	XM	7,629	9,021	10,424	11,672	12,986	14,226	15,509			
(Jul-2007)	Sirius	6,025	8,136	10,022	11,395	12,560	13,626	14,737			
	Total	13,654	17,157	20,446	23,067	25,546	27,852	30,246			
RBC Capital Markets[7]	XM	7,629	9,077	10,687	12,379	14,118	15,743	17,300	18,793	20,236	21,642
(Feb-2007)	Sirius	6,025	8,154	10,453	12,343	13,888	15,190	16,266	17,183	17,987	18,712
	Total	13,654	17,231	21,140	24,722	28,006	30,933	33,566	35,976	38,223	40,354
Bank of America[8]	XM	7,629	9,116	10,781	12,411	13,937					
(Feb-2007)	Sirius	6,025	8,007	9,801	11,493	12,814					
	Total	13,654	17,123	20,582	23,904	26,750					
Lehman Brothers[9]	XM	7,629	9,554	11,568	13,632	15,486	17,128	18,508	19,752		
(Feb-2007)	Sirius	6,025	8,354	10,588	12,719	14,665	16,363	17,905	19,414		
	Total	13,654	17,908	22,176	26,351	30,151	33,491	36,412	39,166		
Bear Stearns[10]	XM	7,629	9,253	11,120	12,423	13,699	14,895	16,073	16,925		
(Jan-2007)	Sirius	6,025	8,153	9,978	11,295	12,394	13,102	13,818	14,442		
	Total	13,654	17,406	21,098	23,718	26,093	27,997	29,891	31,367		
Bernstein Research[11]	XM	7,629	10,535	13,568	16,773	19,454					
(Aug-2006)	Sirius	6,025	9,105	11,522	13,759	15,983					
	Total	13,654	19,640	25,090	30,532	35,437					
Average	XM	7,629	9,257	10,986	12,699	14,327	15,365	16,640	18,016	18,822	19,841
	Sirius	6,025	8,284	10,246	11,940	13,417	14,500	15,624	16,859	17,624	18,368
	Total	13,654	17,541	21,232	24,639	27,744	29,865	32,264	34,876	36,445	38,209

Notes:
Forecasts are in thousands.
Sources:

[1] XM and Sirius Form 10-K data (2006).

[2] Mark Wienkes, *Sirius 3Q2007 largely in line, OEM shift accelerates; maintain Sell* (October 30, 2007), Goldman Sachs at 8.

[3] XM - Kidd, William, *XM Satellite Radio (XMSR) Given Recent Appreciation and Still Difficult Merger Prospects, Downgrading XM to SELL in Favor of Sirius* (October 5, 2007), Wedbush Morgan Securities at 9.
Sirius - Kidd, William, *Sirius Satellite Radio (SIRI) Q3 Preview: OEM Adds Should More Than Offset Continued Retail Softness* (October 5, 2007), Wedbush Morgan Securities at 9.

[4] XM - Moran, Frederick W. and Clayton F. Moran, *XMSR: Merger Possibility Improving* (September 6, 2007), Stanford Group Company at 4.
Sirius - Moran, Frederick W. and Clayton F. Moran, *SIRI: Growth and profitability still in question as merger prospects improve* (September 6, 2007), Stanford Group Company at 3.

[5] Dix, James G., *Audio Signals Satellite Radio 2Q07 Preview* (July 25, 2007), Deutsche Bank at 14, 22.

[6] XM - Kraft, Bryan and Philip Mutooni, *Mixed 2Q Performance (XMSR)* (July 26, 2007), Credit Suisse at 3.
Sirius - Kraft, Bryan, John Klim and Philip Mutooni, *Sirius Satellite Radio (SIRI) Strong 2Q Results Overall: OEM Ramping, Retail Still Weak* (July 31, 2007), Credit Suisse at 3.

[7] Bank, David and Ryan Vinsyard, *XM Satellite Radio - Fundamentals Remain Challenged, But Potential Merger Synergies Offer Upside* (February 27, 2007), RBC Capital Markets at

[8] Jacoby, Jonathan A., *BofA Broadcast Bits – Will Price Talk be a Problem?* (February 28, 2007), Bank of America at 3.

[9] XM - Jayant, Vijay and James M. Ratcliffe, *XM Satellite Radio - Discipline in Weak Retail Environment* (February 27, 2007), Lehman Brothers at 4.
Sirius - Jayant, Vijay and James M. Ratcliffe, *Sirius Satellite Radio - Lowering PT, Changing 07 Outlook* (February 26, 2007), Lehman Brothers at 5.

[10] Peck, Robert S., Kunal Madhukar, Lilian Y. Zhou and Victor B. Anthony, *MergeCo Synergies Could Reach $6.7B* (January 23, 2007), Bear Stearns at 13, 14.

[11] Moffett, Craig and Judah Rifkin, *Satellite Radio: Are We There Yet? (...e Bottom, That is)* (August 17, 2006), Bernstein Research at 20, 23.

EXHIBIT B

Thomas W. Hazlett,
THE ECONOMICS OF
THE SATELLITE RADIO MERGER, Part II

REDACTED

FOR PUBLIC INSPECTION

THE ECONOMICS OF THE SATELLITE RADIO MERGER, Part II

Thomas W. Hazlett
Professor of Law & Economics
George Mason University
Former Chief Economist,
Federal Communications Commission

Nov. 8, 2007

This paper was commissioned by XM and Sirius. The analysis and conclusions are solely those of the author. The author thanks George Bittlingmayer, Art Havenner, Shane Moser, Raquel Noriega, Michael Parente, and Arlington Economics for valuable assistance in the preparation of this manuscript.

TABLE OF CONTENTS

I. INTRODUCTION

On June 14, 2007, I submitted a White Paper to the Federal Communications Commission entitled, "The Economics of the Satellite Radio Merger."[1] The paper evaluated evidence related to the proposed merger between Sirius and XM, concluding that the transaction would expand output in audio entertainment services, benefiting consumers.

Since then, the terrestrial broadcasting industry has funded four additional reports (three by Prof. J. Gregory Sidak and one by Prof. Steve Wildman), which critique my White Paper.[2] This study addresses the key issues raised in those papers, as well as one produced by the Consumer's Union, demonstrating that nothing in these papers effectively rebuts arguments in the White Paper nor casts doubt on the merger's pro-consumer consequences. In brief, that policy conclusion is driven by the following considerations:

- SDARS competes with terrestrial broadcasting and a host of other audio media, according to consumer survey data, listening patterns, subscriber data, firm behavior, and financial returns, yielding very low market share and making post-merger price increases unprofitable;
- Financial analysts ascribe the dimming financial prospects for XM and Sirius in recent years to the emergence of new media such as MP3 players, Internet radio, and cellphone-based music services, attesting to the strength of inter-modal rivalry;
- Independent analysts forecast that the XM-Sirius merger will generate at least $3 billion in net present value cost savings;
- Industry analysts likewise predict that the combination will enable satellite radio to substantially enhance the attractiveness of its offerings, increasing the rate of subscriber growth, implying that quality-adjusted prices will fall post-merger;
- The current (pre-merger) market structure does not produce the strongest possible satellite radio product, the best competitor for consumers, nor produce competitive returns for investors;
- The lack of profitability is evidence of an absence of market power;
- Market share tests used by regulators to gauge the degree of rivalry between broadcast television and cable TV, a methodology suggested by the National

---

[1] Thomas W. Hazlett, *The Economics of the Satellite Radio Merger*, paper submitted to the Federal Communications Commission by XM and Sirius (June 14, 2007) ("White Paper" and "Hazlett 2007").

[2] *Supplemental Declaration of J. Gregory Sidak Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.* (July 9, 2007) ("Sidak II"); *Second Supplemental Declaration of J. Gregory Sidak Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.* (July 24, 2007) ("Sidak III"); *Third Supplemental Declaration of J. Gregory Sidak, Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio, Inc. and XM Satellite Radio,* (Oct. 1, 2007) ("Sidak IV"); and *Declaration of Steve S. Wildman Concerning the Consolidated Application for Authority to Transfer Control of XM Radio Inc. and Sirius Satellite Radio Inc.* (July 23, 2007) ("Wildman 2007"). These papers appeared after *Expert Declaration of J. Gregory Sidak Concerning the Competitive Consequences of the Proposed Merger of Sirius Satellite Radio, Inc. and XM Satellite Radio, Inc.* (Mar. 16, 2007) ("Sidak I").

Association of Broadcasters' economic expert, place satellite radio as "effectively competitive";

- Creating a more efficient satellite radio competitor via merger will enhance competitive options for customers, explaining why incumbent terrestrial broadcasting stations fiercely oppose the transaction.

This latter point provides strong and obvious evidence the merger is pro-competitive, and a number of independent observers have noted it. The financial website, The Motley Fool, for instance, sees the broadcaster anti-merger antics as illuminating:

> **Defending its terrestrial life**
>
> The NAB [National Association of Broadcasters] is obviously threatened. As the mouthpiece for its terrestrial-radio constituency, it realizes that a lot of money -- potentially in the billions -- can be realized in deal synergies if XM and Sirius are allowed to combine. That's why it's comical to see the NAB take XM and Sirius to task as a potential monopoly, when the combination is actually threatening the livelihood of the free AM and FM radio stations the association watches over.
>
> When the NAB attacks the combination as bad for consumers, how can it be taken seriously? If prices inch higher and diversity thins out -- as the NAB has contested in the past -- wouldn't that be a blessing to conventional stations, which are seeing their more avid listeners flock to XM and Sirius? How can it pretend to be neutral, when it actually fears the opposite of what it's publicly proclaiming?[3]

The broadcasters' merger attack[4] spins the strategy 180-degrees, with Prof. Sidak offering that – "[o]nce one scrutinizes this proposed merger with a modicum of skepticism informed by public choice theory"[5] – it becomes clear that XM and Sirius are engaged in a rent-seeking enterprise. The distinction between *creating* billions of dollars in social gains via merger as opposed to *grappling over transfers* is lost, as is the central ingredient in rent-seeking: *rents*. As detailed in my White Paper, XM and Sirius have collectively failed to generate the profits (either earned or anticipated, as per forward-looking market valuations) necessary to fulfill this simple requirement.

The public choice framework, however, aptly explains the actions of terrestrial broadcasters in opposing the merger to protect existing rents. As a strategic matter, firms often attempt to deny rivals possible economies so as to keep quality-adjusted prices high

---

[3] Rick Aristotle Munarriz, *Get It On, XM and Sirius*, THE MOTLEY FOOL (Sept. 13, 2007); http://www.fool.com/investing/high-growth/2007/09/13/get-it-on-xm-and-sirius.aspx (emphasis original).

[4] The funding organization for the Sidak and Wildman papers is the Consumer Coalition for Competition in Satellite Radio (C3SR), a recent creation of terrestrial broadcasters. See Drew Clark, *Broadcaster-Supported Group Recruits Virginia Gubernatorial Candidate to Lobby FCC Republicans,* Center for Public Integrity (April 18, 2007); http://www.publicintegrity.org/ telecom/telecomwatch.aspx?eid=2833.

[5] Sidak II, par. 5.

for consumers.[6] Tactically, voluminous briefs and expert reports can overload regulators and confuse the consumer welfare analysis. Such a situation protects the status quo, delaying decisions and raising the chances that competitive rivals will be deterred.

Hence, the Federal Communications Commission has been flooded by paper generated by the National Association of Broadcasters. A large number of the economic arguments put forward are without any merit, relying on misrepresentation of my White Paper or existing antitrust policy. In the three criticisms of my White Paper undertaken (thus far) by Professor Sidak, numerous of my arguments are misquoted, for example, offering up a straw man to counter. An illuminating example is Prof. J. Gregory Sidak's assessment given here

> ... Professor Hazlett cites Wall Street's approval of the merger as support for the claim that the merger would be procompetitive. On eight separate occasions, he refers to the estimated cost savings of $3 billion to $7 billion. But the fact that the merging parties might enjoy a private benefit (in terms of reduced fixed costs) does not imply that SDARS customers would be better off. According to Professor Hazlett, "If these independent analytical assessments (related to expected cost savings) are accurate, and there is no evidence suggesting they are not, then this assessment is dispositive." I disagree. Although this assessment by Wall Street analysts might be dispositive of something else, it is not dispositive that the proposed merger would be in the public interest. Professor Hazlett elevates the opinion of Wall Street analysts, who judge transactions on a completely different standard—namely, the effect on shareholder wealth. As with other merger proponents, the opinions of antitrust authorities, who use the criterion of consumer welfare, appear not to count.[7]

This suggests that I offered an efficiency conclusion based only on valuation increases for XM and Sirius shareholders. If true, the approach would clearly fail to differentiate a pro-competitive merger from a pro-monopoly one. *Any* proposed industrial combination, as evidenced by the revealed preference of the stockholders who attempt to engage in it, satisfies this test. It is the task of competition policy to gauge how well such transactions extend benefits to consumers.

How then to explain the cited material from my White Paper? By use of scissors. Prof. Sidak omits from my analysis its essential component, and then pounces on 'my views' as flawed due to the omission. Here is the actual passage from the White Paper:

---

[6] Thomas G. Krattenmaker and Steven C. Salop, *Antitrust Analysis of Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power Over Price,* 96 YALE LAW JOURNAL 209 (Dec. 1986). See also, William J. Baumol and Janusz A. Ordover, *Use of Antitrust to Subvert Competition,* 28 JOURNAL OF LAW & ECONOMICS 1 (May 1985); R. Preston McAfee and Nicholas V. Vakkur, *Strategic Abuse of the Antitrust Laws,* 3 JOURNAL OF STRATEGIC MANAGEMENT EDUCATION 1 (2004).

[7] Sidak II, par. 38 (footnotes omitted).

> Finally, it is instructive that the investment community consensus views the XM-Sirius merger as leading to between $3 billion and $7 billion in synergies, and *does not* anticipate gains from price increases post-merger. Instead, analysts see the merger as an attempt by satellite radio suppliers to drive costs down and to offer a more competitive product to customers. The perceived strategy is to hold down prices while expanding product quality. Stifel Nicolaus analysts project the merger will *increase* subscriber growth -- "the combo will be able to offer more programming by combining channels leading to 1MM more subs over time" – precisely the quality-adjusted price competition that benefits consumers.
>
> If these independent analytical assessments are accurate, and there is no evidence suggesting they are not, then this assessment is dispositive. Transactions likely to expand output are pro-competitive. A merger that reduces effective prices to subscribers and delivers billions of dollars' worth of cost saving efficiencies is in the public interest under either a "consumer welfare" or a "total welfare" standard.[8]

My "dispositive" conclusion was based on the assessment that enormous cost savings would be gained *and* that quality-adjusted prices would decline. This produces the conclusion that the merger is pro-competitive under standard antitrust analysis. I did not base my argument solely on the wealth effects on the merging parties, and the contention that I did was wholly premised on a surgical procedure performed by Prof. Sidak.[9]

This paper is an attempt to correct as many of such errors and omissions as is efficient.[10] First, I focus on the substantive issue of consumer welfare, analyzing the XM-Sirius merger in light of the issues raised. Next, I attempt to square the record with respect to the criticisms of the White Paper launched by Prof. Sidak. I show that Sidak II, III, and IV fail to correct Sidak I's miscalculation of "critical elasticity" and reaches obviously flawed conclusions. I go on to explain that Prof. Sidak mis-states antitrust law and economics as regards fixed cost efficiencies, the importance of information gleaned from suppliers and financial markets, and the probative value of competitor opposition to a horizontal merger.

In addition, the financial event study offered in Sidak III is shown to be fatally flawed, incorrect even in its choice of event date (when the satellite radio merger became

---

[8] White Paper, pp. 22-23.

[9] Argument by artifice is a motif. Elsewhere, for instance, Prof. Sidak asserts that I "implicitly" suggest that regulators should embrace a "total welfare" model. He then charges that "Professor Salop's Previous Endorsement of the 'True' Consumer Welfare Standard Contradicts Professor Hazlett's Previous Declaration in This Proceeding" (Sidak IV, par. 87). In fact, the White Paper does not discuss the choice of an antitrust standard. Moreover, the paper was submitted to the Federal Communications Commission, where the standard, by statute, is "public interest, convenience or necessity."

[10] A complete response to all errors would consume vast resources and is not attempted here. Sidak II, e.g., is critical of the fact that I submitted a White Paper, rather than a Declaration, to the FCC. Responding, it seems to me, passes beyond the range of positive marginal social value.

known to traders and altered share prices), revealing nothing of value for merger analysis. Other important evidence, including expert analyst forecasts that the merger will increase satellite radio sales, is presented in this paper to fill the void. With respect to the ambitious explanation offered by Professors Sidak and Wildman, that broadcasters oppose the merger not because they fear a loss of listeners but because they fear a loss in ad sales when the post-merger firms increases ad inventories, the 'two sided' theory they present actually forgets one side of the market, and is rejected even by the protagonists – terrestrial broadcasters – whose behavior it seeks to explain. Finally, this paper shows that the "localism" arguments Prof. Wildman puts forth against the merger vividly demonstrate precisely the anti-competitive motive and effect of the NAB's position.

II. THE COMPELLING CASE FOR MERGER

The fundamental question to answer in evaluating a proposed merger is: will the transaction, on net, lower prices and expand output? If it does, the outcome is pro-consumer and socially efficient.

The evidence is compelling that the satellite radio merger proposed by XM and Sirius will, indeed, be output expanding and, hence, pro-competitive. Inter-modal competition in audio entertainment is weakened by the inability of satellite radio to seize economies of scale and scope. By combining, merger-specific efficiencies will enable the post-merger firm to generate a better mix of programming to appeal to more customers, increasing subscriber growth and the probability that it will be able to successfully appeal to customers in the market for audio entertainment services. Given the choices available to consumers, there is no opportunity for satellite radio to restrict output in order to enjoy supra-competitive returns. Indeed, market valuations of the firms – with or without the merger – reveal that expected returns are far short of monopoly levels. The economic case has been convincingly put forward by the merging parties,[11] by the expert declaration filed by Prof. Steven Salop et al.,[12] and in my previous White Paper.

Merger appraisals provided by independent analysts strongly support the efficiency conclusion. Investment community research pegs the net present value at $3 billion to $7 billion,[13] and importantly calculate such gains assuming that retail prices do not rise. The lower costs improve satellite radio's ability to compete with broadcast radio and its other rivals, enjoying lower capital costs, operating costs, and customer acquisition costs. In addition, customers will be given more valuable program choices, as

---

[11] *Consolidated Application for Authority to Transfer Control of XM Radio Inc. and Sirius Satellite Radio Holdings Inc.*, (submitted to the FCC March 20, 2007) ["Merger Application"], and *Joint Opposition to Petition to Deny and Reply Comments of Sirius Satellite Radio Inc. and XM Satellite Radio Holdings Inc.*, (submitted to the FCC July 24, 2007).

[12] See *Joint Opposition to Petitions to Deny and Reply Comments of Sirius Satellite Radio Inc. and XM Satellite Radio Holdings Inc., Exhibit A, Steven C. Salop, Steven R. Brenner, Lorenzo Coppi, Serge X. Moresi, and CRA International, "Economic Analysis of the Competitive Effects of the Sirius XM Merger,"* (submitted to the FCC July 24, 2007) ["Salop et al, 2007"].

[13] White Paper, p. 7.

the most popular satellite channels become available to a larger universe of subscribers post-merger. As Stifel Nicolaus forecasts, the merger will increase the rate of subscriber growth – signaling the pro-competitive outcome of specific interest to regulators.[14]

Even prior to the merger announcement, expert commentary attributed the financial constraints facing satellite radio to market competitiveness: "Among the challenges XM and rival Sirius face is the popularity of MP3 players such as iPods and the emergence of high-definition radio broadcasts."[15] Such inter-modal rivalry is seen to be intensifying:

> ...the highest hurdle satellite radio has is one that it may not be able to jump. It is the "iPod phenomenon". The devices that consumers use to listen to music and other programming are radically different than they were when satellite radio started to become widely available five years ago. Now content is available over the airwaves to next generation handhelds, Zune's, iPhones, and all manner of new multimedia device. As municipal WiFi is built out and WiMax networks like the one Sprint (S) is building come online, the ability to get programming on devices other than satellite radio will increase exponentially.[16]

In short, satellite radio competes with inter-modal rivals, and the post-merger firm will produce efficiency gains that make its costs lower and its products more appealing to consumers, lowering quality-adjusted prices and expanding subscriber growth. No argument presented by merger opponents seriously challenges that conclusion.

III. ERRORS IN SIDAK II, III, AND IV

The criticisms launched in Sidak II, III, and IV consist very largely of shadow boxing. For instance, Sidak II takes issue with the White Paper's purported position as to which party bears the burden of proof in a merger approval. My paper simply does not contain the position critiqued.[17] In Sidak IV, the claim is made that I argue against a

---

[14] Kit Spring and John Wren, *Satellite Radio Merger Attempt Likely, Based on History & Risk/Reward*, STIFEL NICOLAUS (Nov. 27, 2006), ("Spring 2006"), pp. 1 and 4.

[15] Scott Moritz, *Technology: Sour Note for XM*, TheStreet.com (Jan. 22, 2007); http://www.thestreet.com/newsanalysis/techgames/10333867.html.

[16] Douglas A. McIntyre, *15 Companies Management Can't Fix: Sirius/XM*, 24/7 WALL ST. (Feb. 22, 2007); http://www.247wallst.com/2007/02/15_companies_ma.html.

[17] According to Sidak III (pars. 4 and 10):

> Professor Hazlett mischaracterizes which party bears the burden of proof in this merger proceeding, claiming that the burden falls on both merger opponents and regulatory agencies... Professor Hazlett also says that 'the burden of proof should not be on the marketplace,' implying that opponents of the merger bear the burden of proof (footnotes omitted).

This was not what was "implied." The cited passage argues that the essence of merger analysis is to discern whether a proposed industrial combination will further consumers' interests. The actual passage is as follows:

consumer welfare standard in antitrust analysis.[18] In fact, I make no such argument, and offer the conclusion that both consumer and producer surplus are likely to increase via the merger, which (as the White Paper notes) makes it irrelevant whether one analyzes the merger under a Consumer Welfare or Social Welfare standard.

Substantial errors beyond misrepresentation are made. Sidak II assails my use of financial and firm data, arguing that only "*consumer* perceptions"[19] are relevant in market definition. The claim is bogus; courts and the U.S. antitrust agencies explicitly engage in an "integrated analysis" that considers many different informational inputs, including those garnered from business behavior, firm performance, and interviews with business executives.

Prof. Sidak also argues that it is entirely irrelevant to consider the self-interested positions of satellite radio's rivals, terrestrial broadcasters, who strongly oppose the merger.[20] Such a position clearly stands contrary to common sense and to the opinion of numerous economic and judicial experts in the field, as I describe below in Section III.B. Moreover, he simultaneously argues that the merger is explained by the rent-seeking motives of XM and Sirius, offering the assertion as evidence against the pro-consumer impact of the merger.

Sidak III also presents an event study, examining stock market returns to discern likely effects of the merger.[21] The study fails to identify "pure plays" necessary for analysis, to properly interpret its statistical results, or even to correctly determine the trading day when news of the satellite radio merger became known to capital markets. The financial market data, correctly analyzed below, present absolutely zero support for Prof. Sidak's portrayal of the satellite radio merger as output-reducing.

What may be most revealing is what Sidak II, III and IV do not do: remedy the numerous analytical errors in Sidak I. In describing its key metric, the "critical elasticity" derived via a SSNIP test,[22] Sidak I's numerical calculation was erroneous. Sidak III

> Courts and regulatory authorities grapple with the [relevant merger market] issue by examining various price and output measures, along with consumer surveys and other evidence. What is a more fundamental point in any competitive analysis, however, is that the burden of proof should not be on the marketplace. That is to say, where increasing consumer welfare is the objective of public policy, the question is not whether the market – as defined one way or the other – is sufficiently competitive. The determinative policy cut is *whether the proposed merger will likely increase or decrease the value of services available to consumers* (White Paper, p. 12; emphasis in original).

Nowhere in my paper, including here, did I opine on which party bears the legal "burden of proof" in merger proceedings.

[18] Sidak IV, par. 87.

[19] Sidak II, par. 22 (emphasis in original).

[20] "The argument that NAB's opposition to the merger is proof that the merger is procompetitive is incorrect as a matter of logic, erroneous as a matter of economic analysis, and irrelevant as a matter of antitrust law." Sidak II, par. 50.

[21] Sidak III, pars. 36 to 47.

[22] The SSNIP test deduces whether a small but significant non-transitory price increase would be profitable for the post-merger firm.

answers my earlier explanations to this effect bluntly, "there is no mistake,"[23] insisting that, had one read a footnote as it could have been written and not as it appeared in Prof. Sidak's paper, the calculation would have been correct. In responding to the criticism in the White Paper that he had mistakenly calculated a critical elasticity = -1.52 rather than (using his assumptions) the actual value of -1.43, Prof. Sidak is again dismissive, asserting that the difference is "not economically significant."[24] In identifying his miscalculation as empirically irrelevant, he powerfully testifies to the very imprecision which renders his analysis weak.

In applying his "critical elasticity" to conduct a SSNIP test, Prof. Sidak is no more successful. The analysis uses gross margins to measure market power. The embedded assumption is that price equals marginal cost in competitive equilibrium. In an industry where it is efficient to use a significant degree of fixed, upfront investment, then, the gross margin metric over-estimates market power. A standard example is found in a market where high gross margins (say in restaurant service) co-exist with low (competitive) profits. In such circumstances, the mechanistic application of a SSNIP test, inferring substitution among products entirely as a function of the gross margins of current suppliers, is inappropriate.[25]

Prof. Sidak asserts that terrestrial radio and satellite radio are not close substitutes and do not compete, a view explicitly rejected by his client. The NAB has long held that radio stations lose listeners to satellite radio, reducing revenues.[26] Further, the NAB openly promotes the new and very large investments being made by its members in HD Radio, deeming the high-quality audio service "critically important for terrestrial stations in view of the launch of two satellite distributed digital audio radio services in 2001."[27]

Perhaps a more telling error occurs when Prof. Sidak, in applying the SSNIP test uses – as his only "direct evidence" of what the post-merger satellite radio elasticity of demand would be – the price rise initiated by XM in 2005. Asserting that the price increase did not result in a decline in sales,[28] Sidak then offered this as evidence that the post-merger elasticity was low – presumably less than the "critical elasticity" he had (mis)calculated. But if the market data Sidak presented were correct, his economic conclusion is wrong: the observation that an XM price hike did not lower sales would lead to the conclusion that XM and Sirius occupy *separate markets*. A merger would therefore have no anti-competitive effect.

---

[23] Sidak III, par. 22.

[24] Ibid.

[25] Jonathan Baker, *Market Definition: An Analytical Overview*, 1 ANTITRUST LAW JOURNAL (2007).

[26] See White Paper, Appendix I, for a litany of statements filed by the NAB objecting to competition from satellite radio.

[27] Donald R. Lockett, The Road to Digital Radio in the United States (Washington, D.C.: National Association of Broadcasters; 2004), p. xvii. The book was published as an "NAB Executive Technology Briefing."

[28] This is dubious factually, as Sidak failed to properly adjust sales figures for underlying time trends and quality changes. See Salop et al., 2007.

Prof. Sidak defends his SSNIP test by distancing it from Sidak I: "Although it does constitute 'direct evidence' of elasticity, XM's 30 percent price increase was not offered as a point estimate for the actual elasticity of demand facing a hypothetical monopoly provider of SDARS. It was intended to demonstrate the general insensitivity of demand for SDARS with respect to changes in price."[29] Whatever was intended, what it did do was reveal that a mechanistic approach to "critical elasticity" reaches unrealistic conclusions.

Both Sidak III and the paper by Prof. Steve Wildman attempt an explanation of the NAB's opposition to the satellite merger that ostensibly aligns broadcasters' interests with those of consumers. The theory is that terrestrial broadcasters oppose the merger because they fear that it will result in a greater number of commercials. The argument collapses under the weight of the evidence, including that offered by the NAB's own stated positions. This analysis is provided below at Section III.F.

A. MARKET DEFINITION

One Sidak theme is that I "appear to reject the current antitrust paradigm for analyzing mergers," offering "novel theories" seeking to "radically redesigning the framework..."[30] The bluster is groundless. My analysis, properly reported, informs the standard merger analysis used at U.S. regulatory agencies.

Conversely, Prof. Sidak offers numerous interpretations that are incorrectly attributed to current antitrust policy. In defining markets, Prof. Sidak insists that only evidence gleaned directly from consumers is properly considered. Incorporating views or actions of suppliers "ignore[s] the standard economic methodology in merger cases."[31] As the paper continues:

> Any law student taking antitrust knows that the *Merger Guidelines* dictate that market definition be done on the basis of *consumer* perceptions, not from the perspective of producers....[32]

This mis-states U.S. antitrust enforcement practice where the performance and self-interested viewpoints of firms in the marketplace are thought to yield probative evidence. As Judge Paul L. Friedman wrote in his August 2007 opinion in *Federal Trade Commission v. Whole Foods*:

> [A]nother factor that leads to the conclusion that the relevant product market in this case must be larger than premium and organic supermarkets and, indeed, that it is at least as broad as supermarkets: how the players in

[29] Sidak III, par. 25.
[30] Ibid., par. 3.
[31] Sidak II, par. 22.
[32] Ibid. (emphasis original).

> the marketplace view each other and how their conduct reflects those views.[33]

In fact, it would "radically redesign the framework for antitrust analysis"[34] to exclude evidence gleaned from firms in the marketplace. In defining what products substitute for each other and what firms compete with particular rivals, the information collectively held by firms is large; the supply side is likely to be a rich source of reliable product information. The Merger Guidelines incorporate just this appreciation. Here is what Section 1.11 actually says regarding relevant evidence:

> In considering the likely reaction of buyers to a price increase, the Agency will take into account all relevant evidence, including, but not limited to, the following: (1) evidence that buyers have shifted or have considered shifting purchases between products in response to relative changes in price or other competitive variables; *(2) evidence that sellers base business decisions on the prospect of buyer substitution between products in response to relative changes in price or other competitive variables;* (3) the influence of downstream competition faced by buyers in their output markets; and (4) the timing and costs of switching products.[35]

Another approach to market definition bears notice. In Sidak I, the assessment of "effective competition" in cable television was offered as an apt analogy for satellite radio. Cable TV, a multi-channel video subscription service, faces rivalry from over-the-air broadcast TV; the parallel to the position of satellite radio vis-à-vis terrestrial broadcast radio appears clear. Sidak I tells us that the 1992 Cable Act "recognized that the broadcast medium could not effectively compete with the emerging and increasingly popular multichannel subscription-based services..."[36] It goes on to note that the Act states that "without the presence of another multichannel video programming distributor, a cable system faces no local competition."[37] Sidak I offers this as a primary exhibit in its market definition, which includes only satellite radio.

The analogy, as shown in the White Paper, actually leads to precisely the opposite conclusion. The 1992 Cable Act included three ways to identify "effective competition" for cable television systems, depending on the geographic market. One deemed a market "effectively competitive" where the local cable system served fewer than thirty percent of households; in such areas, broadcast TV was seen to be a sufficient substitute. Given that

---

[33] *FTC v. Whole Foods and Wild Oats,* Civil Action No. 07-1021 (PLF), United States District Court, District of Columbia Opinion (filed Aug. 16, 2007), pp. 63-4.

[34] "Even if Professor Hazlett is correct about radically redesigning the framework for antitrust analysis of the horizontal mergers, it is not appropriate for the FCC to announce some alternative merger guidelines without a proper rulemaking simply because doing so would suit the current merger proponents." Sidak III, par. 15.

[35] U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines,* (Revised 1997), §1.11 (emphasis added). http://www.usdoj.gov/atr/public/guidelines/horiz_book/11.html.

[36] Sidak I, par. 38.

[37] Ibid.